

Automated Extraction of Crop Area Statistics from Medium-Resolution Imagery, Phase II

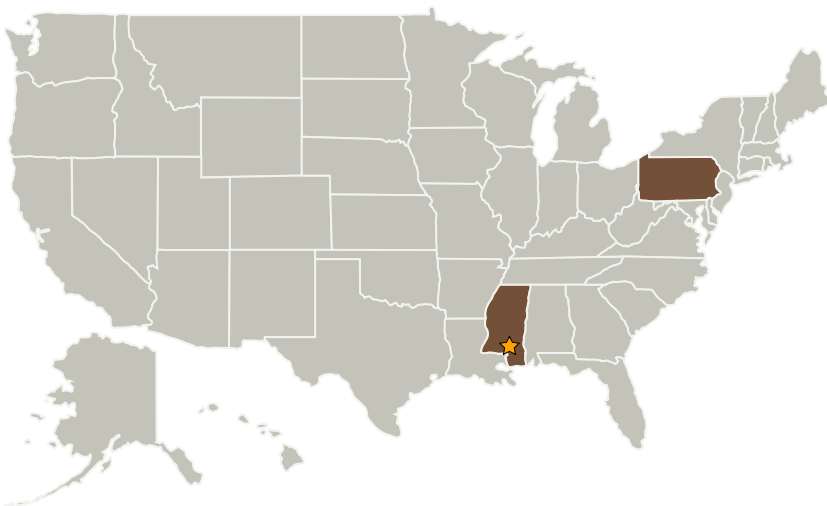
Completed Technology Project (2006 - 2008)



Project Introduction

This project is focusing on the strategic, routine incorporation of medium-resolution satellite imagery into operational agricultural assessments for the global crop market. Automated algorithms for rapid extraction of field-level crop area statistics from Landsat and Landsat-class imagery (including Landsat 5 TM, Landsat 7 ETM+, AWiFS, ASTER, SPOT, LDCM, etc.) are under development. For prototype development, the project is collaborating with the Production Estimates and Crop Assessment Division of the USDA Foreign Agricultural Service. The Phase I prototype algorithms, based on Bayesian Probability Theory, incorporate multiple lines of evidence in the form of prior and conditional probabilities and implement an innovative approach to supervised image classification allowing for automated class delineation. The knowledge-based expert classifiers prototyped during Phase I were tested and validated at selected pilot sites across the globe. The results of the Phase I work have clearly demonstrated the technical feasibility of the GDA approach to automated crop area assessment with medium resolution imagery. Development undertaken during Phase I resulted in a robust, fully functional set of modules that are capable of processing large volumes of data and allow for accurate crop detection, area estimation, and crop acreage change assessment with minimal user intervention. The prototype algorithms were tested on a range of test sites, sensors, crop types, and crop conditions. A non-rigorous validation study proved the reliability and accuracy of the prototype algorithms. The overall results of the project will enhance global agricultural production estimates by improving the timeliness and accuracy of field-level crop area estimates.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
GDA Corp.	Supporting Organization	Industry	State College, Pennsylvania

Primary U.S. Work Locations	
Mississippi	Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
 - ↳ TX16.3 Traffic Management Concepts